

and subrecurved, with a long spreading spine, the inner erect and not spinose. In *C. guatemalense* the phyllaries (except the inmost) are all similar, erect, and strongly graduated in length from the short outer to the long inner.

BOTANY.—*The American species of Elytraria.*¹ E. C. LEONARD, U. S. National Museum. - (Communicated by E. P. KILLIP.)

Elytraria, a genus of Acanthaceae, subfamily Nelsonioideae, was described² by Michaux in 1803. He published at this time a single species, *E. virgata*, citing as a synonym *Tubiflora carolinensis* Gmel.³ Although antedating *Elytraria*, *Tubiflora* is rejected by the International Rules. Since Michaux's publication about 30 species have been described by various authors, though most of these have been reduced to synonymy.

The name *Elytraria* is derived from the Greek *ελυτρον* (*elytron*, sheath), in reference to the firm coriaceous bracts which sheathe the scapes and subtend the flowers. When herbaceous and having a rosette of basal leaves, fibrous roots, and simple scapes tipped by cylindrical spikes, these plants superficially resemble the common plantain (*Plantago*). The flowers are white or blue, and inconspicuous. In *E. tuberosa*, here described as new, the roots are thick-fusiform, resembling those of *Ruellia tuberosa*. In all other species of the genus the roots are fibrous.

The genus, as here regarded, consists of seven species, all native of temperate or tropical America, except *E. acaulis* (L. f.) Lindau, which is found chiefly in Africa. *Elytraria squamosa* (Jacq.) Lindau, widely distributed throughout tropical and subtropical America, is found also in Asia and the Philippine Islands.

KEY TO THE AMERICAN SPECIES

Flower bracts, or at least some of them, tridentate, the lateral teeth scarious, triangular or rhombic, the middle tooth awn-shaped; plant usually caulescent. 1. *E. squamosa*.

Flower bracts entire; plant acaulescent.

Scapes 15 to 35 cm. long, much exceeding the leaves.

Leaf blades oblong-elliptic, usually more than 2 cm. wide.

2. *E. caroliniensis*.

¹ Published by permission of the Secretary of the Smithsonian Institution. Received June 12, 1934.

² Fl. Bot. Amer. 1: 9. pl. 1. 1803.

³ J. F. GMELIN, Syst. Nat. 27. 1791.

Leaf blades linear-spatulate, less than 1 cm. wide.

3. *E. angustifolia*.

Scapes 2 to 8 cm. long, rarely exceeding the leaves.

Leaf blades ovate, rounded or cordate at base, easily distinguishable from the winged petiole.....4. *E. tuberosa*.

Leaf blades oblong-elliptic or spatulate, gradually narrowed into the winged petiole.

Flower bracts acute, 3 to 4 mm. long; leaves densely pilose.

5. *E. shaferi*.

Flower bracts long-attenuate, 1 cm. long; leaves glabrous or sparingly pilose.....6. *E. bromoides*.

1. *Elytraria squamosa* (Jacq.) Lindau, Anal. Inst. Físico-Geog., Costa Rica 8: 299. 1895.

Verbena squamosa Jacq. Pl. Hort. Schoenbr. 1: 3. pl. 5. 1797.

Elytraria tridentata Vahl, Enum. Pl. 1: 107. 1804.

Elytraria frondosa H. B. K. Nov. Gen. & Sp. 2: 234. 1817.

Elytraria fasciculata H. B. K. Nov. Gen. & Sp. 2: 235. 1817.

Elytraria ramosa H. B. K. Nov. Gen. & Sp. 2: 235. 1817.

Elytraria scorpioides Roem. & Schult. Syst. Veg. Mant. 1: 128. 1822.

Elytraria apargiifolia Nees in DC. Prodr. 11: 65. 1847.

Elytraria microstachya Oerst. Nat. For. Kjöbenhavn Vid. Medd. 1854: 114. 1854.

Elytraria pachystachya Oerst. Nat. For. Kjöbenhavn Vid. Medd. 1854: 116. 1854.

Tubiflora squamosa Kuntze, Rev. Gen. Pl. 2: 500. 1891.

Tubiflora pachystachya Kuntze, Rev. Gen. Pl. 2: 500. 1891.

Elytraria tridentata wrightii Gomez, Anal. Hist. Nat. Madrid 23: 280. 1894.

The type locality of *Verbena squamosa* is unknown. The other species listed above were all based on specimens from tropical America.

RANGE: Arizona and Texas; Mexico and Central America; West Indies; northern and western South America; India; Philippine Islands.

A widely distributed species, extremely variable in its habit of growth. Although occasionally acaulescent and composed of a single spike-tipped scape arising from a rosette of basal leaves, the plant commonly develops a subligneous stem reaching several decimeters in length. From the tip of the stem there usually branches a cluster of scapes bearing from one to several spikes, or instead of spikes a cluster of leaves and secondary scapes, a proliferous condition, thus resulting. The scapes and stems may be simple, or branched in an irregular fashion. This method of growth often produces plants composed of an intricate mass of scapes and spikes which may be, at maturity, entirely devoid of foliage.

A marked variation is to be found also in the leaf blades. Typically oblong to oblong-obovate and 1 to 2 cm. wide, they become at times narrowly linear. Again, very broad leaves essentially ovate in outline are sometimes produced. The margin may be entire or sinuate-dentate. Other marked

variations in size and shape are to be found in the spikes and flower scales. The scarios lateral teeth of the flower bracts may be conspicuous and well developed, or almost if not entirely obsolete.



Fig. 1.—*Elytraria tuberosa* Leonard, sp. nov. A, plant $\times \frac{1}{2}$; B, flower bract $\times 2$; C, calyx $\times 2$.

2. *Elytraria caroliniensis* (Walt.) Pers. Syn. Pl. 1: 23. 1805.

Anonymos caroliniensis Walt. Fl. Carol. 60. 1788.

Tubiflora caroliniensis Gmel. Syst. Nat. 27: 1791.

Elytraria virgata Michx. Fl. Bor. Amer. 1: 9. fig. 1. 1803.

Elytraria cupressina Nees in DC. Prodr. 11: 65. 1847.

Elytraria virgata vahliana Nees in DC. Prodr. 11: 65. 1847.

Elytraria virgata latifolia Nees in DC. Prodr. 11: 65. 1847.

TYPE LOCALITY: Carolina.

RANGE: Coastal plain from South Carolina to Florida.

A species well marked by its large basal leaves and stout virgate scape, tipped by one or more spikes. It is a pine-barren plant frequenting damp sandy woods or thickets.

3. *Elytraria angustifolia* (Fernald) Leonard

Elytraria virgata angustifolia Fernald, Bot. Gaz. 22: 169. 1896.

Elytraria caroliniensis angustifolia Blake, Rhodora 17: 131. 1915.

Tubiflora angustifolia Small, Fl. Miami 168. 1913.

TYPE LOCALITY: Thin calcareous soil near Biscayne Bay, Florida. Type collected by A. H. Curtiss (no. 5494).

RANGE: Southern Florida.

Easily recognized by its long, very narrow leaf blades, but in other respects scarcely distinguishable from *E. caroliniensis*. A plant of low swampy regions.

4. *Elytraria tuberosa* Leonard, sp. nov.

Herba, radicibus tuberiformibus; foliis cum petioli late alato undulato, ovatis, apice obtusatis, basi subcordatis, margine undulato; bracteis oblongis acuminatis.

Acaulescent; roots fusiform-tuberous, 4 mm. thick; leaf blades ovate, 2 to 7 cm. long, 1.5 to 5.5 cm. wide, obtuse at apex, subcordate or occasionally truncate at base, thin, undulate, glabrous except the costa and lateral veins (usually six) which are sparingly pilose; petiole broadly winged, 3 to 15 mm. wide at apex, gradually narrowing to base, the margins undulate; scape up to 4 cm. long, clothed with firm clasping oblong-ovate acuminate ciliate scales about 6 mm. long and 2 mm. wide; spikes solitary or several, terminal, up to 3.5 cm. long and 1 cm. wide; bracts oblong, 8 to 9 mm. long, 2.5 mm. wide, acuminate, firm, faintly 3-nerved, ciliate; bractlets lanceolate, about 5 mm. long, 1 mm. wide, carinate, the keel and margin ciliate; calyx segments lanceolate, 7 to 8 mm. long, 1.5 to 2 mm. wide, acuminate, thin, faintly nerved, pilose at tip, the outermost segment bidentate; corolla 1 cm. long, the tube slender, the upper lip rounded, the lower 3-parted, the segments lobed; capsule oblong, 5 mm. long, 2 mm. broad at base, conical.

Type in the U. S. National Herbarium, no. 1,320,344, collected at El Recreo, Province of Manabi, Ecuador, by H. von Eggers (no. 15405).

Easily recognized by its thin ovate subcordate leaf blades and thickened fusiform roots. This and *E. squamosa* are the only species of *Elytraria* reported from South America.

5. *Elytraria shaferi* (P. Wils.) Leonard

Tubiflora shaferi P. Wils. Mem. Torrey Club 16: 111. 1920.

TYPE LOCALITY: Pinelands, Sierra Nipe, near Woodfred, Oriente, Cuba. Type collected by Shafer (no. 3562).

RANGE: Cuba.

Elytraria shaferi is closely affiliated with *E. bromoides*, but can be separated from that species by its small bracts and pilose leaf blades. In *E. bromoides* the bracts (5 or 6 mm. long and 1 mm. wide) taper to a slender point, and the leaf blades are glabrous throughout or the costa and lateral veins sometimes sparingly pilose. The bracts of *E. shaferi* are, in contrast, merely acute and only half as large.

6. *Elytraria bromoides* Oerst. Nat. For. Kjöbenhavn Vid. Medd. 1854: 115. 1854.

Tubiflora acuminata Small, Fl. Southeast. U. S. 1082. 1903.

TYPE LOCALITY: Pital, Mexico. Type collected by Liebmann. The type locality of *Tubiflora acuminata* is Texas.

RANGE: Texas, Mexico.

The entire bracts readily distinguish this from *E. squamosa*, the only other species found within its range.

PALEOBOTANY.—*Extension of range of Attalea olssoni*.¹ EDWARD W. BERRY, The Johns Hopkins University.

A single specimen of *Attalea olssoni* sent to me recently by Dr. A. A. Olsson extends the range from near the top of the middle Eocene into the Oligocene of northwestern Peru, and also discloses something of the character of the seeds.

The species was described in 1926 and referred to the genus *Astrocaryum*.² Subsequent material which showed more complete



Fig. 1.—*Attalea olssoni* Berry. Natural transverse section.

preservation led to its being transferred to the genus *Attalea*, and the present specimen serves to confirm this identification.³

All of the specimens of this species hitherto collected by myself or others have shown no trace of internal structure and have been filled with matrix or partially occupied by crystallized calcite or geodes. The present specimen is a natural section exposing two seeds and clearly indicating that three were normally present. This confirms the identification of the specimens as belonging to the genus *Attalea* instead of to *Astrocaryum* with which they were at first confused.

The present specimen shows the base and peduncle scar and the characteristic surface features corresponding to those shown by the

¹ Received August 20, 1934.

² BERRY, EDWARD W. U. S. Natl. Museum Proc. 70³: 1, pl. 1, figs. 1-4. 1926.

³ BERRY, EDWARD W. Pan-Amer. Geol. 51: 242, figs. 4-10. 1929.